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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,860	12/19/2001	Paul B. Koeneman	42390.P12041	4678

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EXAMINER

ALI, MOHAMMAD M

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 05/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/028,860

Applicant(s)

KOENEMAN ET AL.

Examiner

Mohammad M Ali

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-29 is/are rejected.
- 7) ☒ Claim(s) 10 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 8, 12-13, 17-19, 21-24, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel (5,396,403). Patel discloses a integrated circuit chips/package comprising an integrated circuit die/thermally conductive plate 19 having an active surface, a cavity 57, substrate 11, solder bumps 17, heat sink 23, cable connection 59 and interposer/chips 13. Patel discloses the invention substantially as claimed as stated above. See Fig. 1 and 4. However, Patel does not disclose cooling fluid. Although it is not disclosed the Examiner obviously considers that the cavity 57 is filled with a cooling fluid.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Lin et al. (6,188,578 B1). Patel discloses the invention substantially as claimed as stated above. However, Patel does not disclose an underfill material. Lin et al. teaches the use of an underfill material 18 in an integrated circuit package for the purpose of serving an integrated circuit. See Fig. 1. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the integrated circuit chips of Patel in view of Lin et al. such that an underfill material could be provided in order to serve the integrated circuit.

Claims 6, 20, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Vogel et al. (6,317,326B1). Patel discloses the invention substantially as claimed as stated above. However, Patel does not disclose a microchannel surface. Lin et al. teaches the use of a microchannel surface 219 in an integrated circuit package for the purpose of serving an integrated circuit. See Fig. 2a. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the integrated circuit chips of Patel in view of Vogel et al. such that a microchannel surface could be provided in order to serve the integrated circuit.

Claims 7, 9, 14-16, 25 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Daikoku et al. (5,349,831). Patel discloses the invention substantially as claimed as stated above. However, Patel does not disclose a pump. Daikoku et al. teaches the use of a pump 14 in an integrated circuit package for the purpose of circulating cooling fluid. See Fig. 1. Therefore, it would have been

obvious to one having ordinary skill in the art at the time the invention was made to modify the integrated circuit chips of Patel in view of Daikoku et al. such that a pump could be provided in order to circulate the cooling fluid.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. # 5,770,478 to Iruvanti et al., # 5,883,783 to Turturro, # 5,889,652 to Turturro, # 6,348,364 B1 to Layton et al., # 6,348,364 to Bruce et al., # 5,880,524 to Xie, # 6,055,154 to Azar and # 5,637,921 to Burward-Hoy.

***Allowable Subject Matter***


Claims 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier from the examiner should be directed to Mohammad M. Ali, whose telephone number is (703) 308-5032. The examiner can be reached from 6:10am to 5:50pm from Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel, can be reached at (703) 308-2597. The fax number for the organization where this application or proceeding is assigned is 703-308-7764 for regular communications and after-final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.

  
William E. Tapolcai  
Primary Examiner  
Art Unit 344



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May 21, 2002